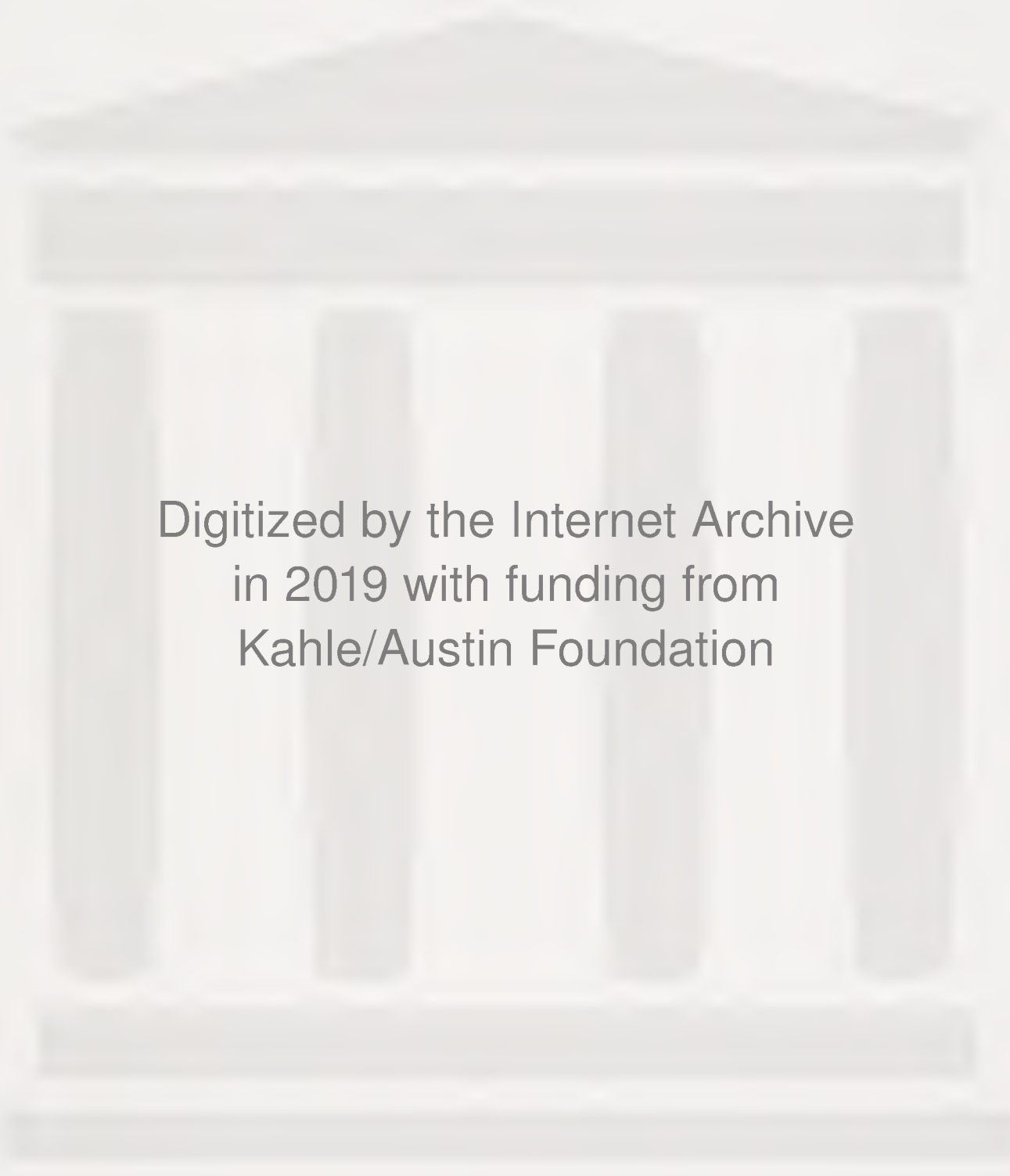


# Rain Forest

Experiments, Games, Art and Writing Activities





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# Rain Forest Activity Book

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## METRIC CONVERSION CHART

Refer to this chart when metric conversions are not found within the activity.

|                   |   |         |                   |   |        |        |        |        |        |   |         |
|-------------------|---|---------|-------------------|---|--------|--------|--------|--------|--------|---|---------|
| $\frac{1}{4}$ tsp | = | 1.25 ml | $\frac{1}{4}$ cup | = | 60 ml  | 350° F | =      | 175° C | 1 inch | = | 2.54 cm |
| $\frac{1}{2}$ tsp | = | 2.5 ml  | $\frac{1}{2}$ cup | = | 75 ml  | 375° F | =      | 190° C | 1 foot | = | 30 cm   |
| 1 tsp             | = | 5 ml    | $\frac{3}{4}$ cup | = | 125 ml | 400° F | =      | 200° C | 1 yard | = | 91 cm   |
| 1 Tbsp            | = | 15 ml   | 1 cup             | = | 230 ml | 425° F | =      | 220° C | 1 mile | = | 1.6 km  |
|                   |   |         |                   |   | 1 oz.  | =      | 28 g   |        |        |   |         |
|                   |   |         |                   |   | 1 lb.  | =      | .45 kg |        |        |   |         |

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# Glossary

**anthropoid**—resembling a person in shape and an ape in action.

**arboreal**—living in or frequenting trees.

**buttress roots**—roots developed to support the heavy trunks and help keep the tall rain forest trees upright.

**camouflage**—the use of shape, patterns, and color to avoid detection by matching or merging into the background.

**canopy**—the next-to-highest layer of the rain forest where towering trees crowns overlap to create a green ceiling that blocks out much of the sunlight.

**clear-cut**—to cut down all the trees in a section of forest.

**climate**—the average of usual weather.

**conservation**—the preservation of natural species and environments from excessive exploitation by humans.

**decomposition**—the rotting of dead matter.

**developer**—anyone who buys land and increases the activity on it.

**deforestation**—clearing the land of trees by cutting and burning.

**ecosystem**—all of the living and non-living things in a particular region.

**emergent layer**—the topmost rain forest layer.

**environment**—the particular combination of conditions in an area which affects the type of living thing inhabiting it.

**epiphyte**—a plant growing on another plant without damaging it; not a parasite.

**equator**—an imaginary line around the Earth that is an equal distance from the North and South Poles.

**endangered**—a population so small that it is at risk of becoming extinct.

**fertile**—so rich in nutrients that plants and forests grow easily and plentifully.

**forest floor**—the ground level of the rain forest.

**greenhouse effect**—the trapping of the sun's heat within the Earth's atmosphere that is causing damage to the atmosphere.

**hunter-farmers**—people who exist by hunting, fishing, and clearing the land to grow their own food.

**hunter-gatherers**—people who exist by hunting, fishing, searching for wild plants and trading with other tribes.

**indigenous**—native, original to a region.

**logging**—cutting down trees and bringing the logs to sawmills to be cut into lumber and other wood products.

**nutrients**—things that provide nourishment for life and growth.

**predator**—an animal that kills other animals for food.

**prey**—an animal that is killed by a carnivore for food.

**shrub layer**—the dim first floor of the rain forest where low-growing, low-light plants and ground-dwelling animals live.

**slash and burn**—farming practice involving cutting the rain forest plants and burning off the fields to clear the land for farming.

**species**—a group of animals or plants that have many common characteristics.

**sustainable**—using in a non-harmful way so it is preserved for the future.

**topsoil**—the soil that lies above the stony ground beneath the rain forest floor; tree roots hold topsoil in place but heavy rains wash it away if trees are destroyed.

**tribes**—the community of people who live together for protection from danger and for a shared way of life.

**tropics**—the two tropical regions on each side of the equator.

**understory**—layer of the rain forest under the canopy where young trees, ferns, and shrubs struggle to grow in the low light.



# Rain Forest Categories

Create your own glossary categories game for grouping rain forest vocabulary as a memory aid. Pull this easy game out to test yourselves on vocabulary whenever you have an extra five or ten minutes.

## Directions

1. Divide the class into teams of four to six students.
2. Give each team a set of 30 index cards that they will fold in half with the blank side on the outside.
3. Divide up the glossary list so each student can make cards for just four or five of the glossary words. They are to write the word on the two blank sides of the index card and its definition on the lines inside, using fairly large, very neat letters.
4. When they have finished, have students work together to arrange the stand-up cards into category columns. They must decide on the category names and make a title card for each column (for instance: levels, land, people, plants, animals, preservation.)
5. Begin playing "Categories." Going clockwise around the group, each student takes a turn by saying a category, then a word in that column, and its definition. The next player checks the answer and decides if it is correct, then takes a turn.
6. Attach a set to the front board so the whole class can play "Categories" with the small groups working together to get the answers.

## Materials

- Lined index cards
- Pencils
- Marking pen



# Introduction

## Information

There are two main classifications of rain forests—*temperate* and *tropical*. Within those classifications there are many specific types of rain forests.

Temperate rain forests receive over 80 inches (203 cm) of rain annually and have four seasons. Most of the world's rain forests are *tropical*, that is, located in the *tropics*, the two regions on each side of the equator. The climate of the tropical rain forest is the most uniform climate on Earth. There are only two seasons in the tropics—wet and dry. Tropical rain forests are often thought of as sizzling hot. In fact, the climate is merely warm and humid with temperatures averaging 70 to 90° (21 to 32°C). Rainfall from 150 to 400 inches (381 to 1000 cm) creates a rich environment for the thousands of varieties of flourishing plant and animal life—colorful birds singing and calling, giant flowers bursting with bright colors, sleek cats prowling, monkeys swinging through the trees. Almost two-thirds of all land-based animals and plants are found in the world's rain forest regions.

## Project

- Create a three-dimensional “Rain Forest Frieze” to display related creative writings and light-weight projects.
- Develop a table top area for displays and exhibits.

## Directions

1. Cover a designated wall space with large sheets of butcher paper. Give the space a large but simple title, such as *Rain Forests of the World*.
2. Divide part of it into five sections, one for each type of rain forest described on page 6.
3. Mount information and light-weight student projects in the appropriate areas of the bulletin board.
4. Set up a table for captioned and labeled Rain Forest Exhibits.

## Materials

- Light blue, tan, or white butcher paper
- Scissors
- Stapler
- Wide marking pen
- White or yellow paper for headings and labels
- Students' rain forest projects





# Types of Rain Forests

## Information

There are five main types of rain forests:

1. *Temperate rain forests* receive over 80 inches (203 cm) of rain annually and have four seasons. They are located along the windward coasts of northwestern North America, New Zealand, and Chile.

2. *Wet lowland evergreen forests*, located in flat river basins like the Amazon basin in Peru and the Congo basin in Africa, make up about two-thirds of the world's tropical rain forest areas. They receive over 100 inches (254 cm) of rain yearly with no long dry spells.

3. *Flooded tropical rain forests* such as the river-flooded Amazon, the coastal tide-flooded *mangrove forests* of Florida and northern South America, or the *swamp forests* of Georgia and Florida, are subject to seasonal flooding or are permanently flooded.

4. *Tropical deciduous forests* have variations of rainfall and a distinct dry season. *Seasonal* or *monsoon forests* are found in Africa and Asia. *Gallery forests* have lush growth along rivers and streams, and may be the remains of an original degraded rain forest.

5. *Montane rain forests* are found in higher altitudes in the wet, tropical areas of Africa, and Asia. *Cloud forests* are mist-drenched; *elfin*, *scrub*, or *moss rain forests* produce small moss-draped trees and ferns stunted by the cooler climate.

## Project

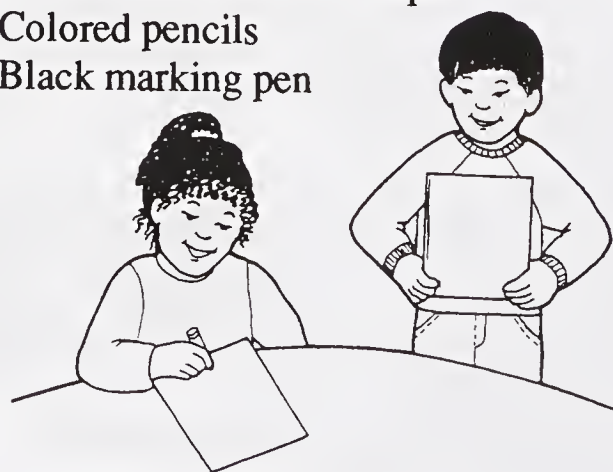
Locate, label, and color the five types of rain forests on a world map.

## Directions

1. Divide into pairs and reproduce the map page for each pair of students.
2. Locate where you live on the map and mark it with a star.
3. Using reference materials and the color key, locate the rain forests of the world on the map, coloring them with the appropriate colored pencil. Label each rain forest.
4. Finish coloring the map and display for the culmination activity.

## Materials

- World map page, following
- Reference books and maps
- Colored pencils
- Black marking pen



### Rain Forest Color Key

|                    |        |
|--------------------|--------|
| Temperate          | Blue   |
| Evergreen          | Green  |
| Flooded Tropical   | Orange |
| Tropical Deciduous | Red    |
| Montane            | Yellow |





# Carbon Dioxide

## Information

Rain forests help to control the world's climate. The canopies absorb *carbon dioxide*—a gas in the atmosphere. Whenever the rain forest is cleared and burned, carbon is released into the atmosphere, making the climate hotter. On the average, one rain forest tree gobbles up 50 pounds (22.7 kg) of carbon dioxide per year—that's 30 pounds (13.6 kg) more than trees growing elsewhere. When a tree is burned, we lose its capability to devour those poisonous gases. Even worse, burning that tree releases its carbon dioxide into the upper atmosphere.

Every acre burned destroys thousands of trees. Scientists warn that too much carbon dioxide in our atmosphere and not enough oxygen produced by trees can lead to serious ecological problems for the world.

## Project

- Conduct two demonstrations to show carbon dioxide being released into the air.
- Carry out a related math activity.

## Materials

- Match
- Calculator (optional)
- Pencils

## Demonstration 1

Create carbon dioxide simply by breathing.

1. Share the information above. Have students breathe deeply a couple times. Explain that when they inhale, they are *breathing in oxygen* that is given off by the leaves of trees. Stress the importance of rain forests in supplying the oxygen we need to breathe.
2. Have students exhale. Explain that they are *breathing out carbon dioxide* which plants gobble up.
3. Have them say, "I breathe in oxygen" before they inhale, and "I breathe out carbon dioxide" after they exhale.

## Demonstration 2

Light a match and observe the small amount of smoke (carbon dioxide) rising into the air. How does the burning of the rain forest trees:

- Add to the smoke (carbon dioxide) rising into the atmosphere, thus causing global warming?
- Remove thousands of trees that could be gobbling up the harmful carbon dioxide?

## Math Activity

Count the number of trees around your school. Using the information above, calculate the amount of carbon dioxide they will consume annually.





# The Water Cycle

## Information

Rain forests are an important part of the *water cycle*, the Earth's way of reusing its limited water supply. Water is always moving and changing in form in a cycle (circle) of rising vapor, falling liquid (or solid ice), running or soaking water, then back to rising vapor again.

The sun draws water vapor from the wet parts of the ground through *evaporation*. As this water vapor rises, water droplets collect around bits of dust to form clouds and fog. Depending upon the temperature, the water drops fall to the Earth as rain, sleet, hail, or snow. The water then filters through the soil, or runs down streams into rivers into ponds, lakes, or the ocean, only to evaporate again. Driven by the sun's heat and energy, blown by global winds, the same risen water is carried as clouds around the world, repeating the never-ending cycle.

## Project

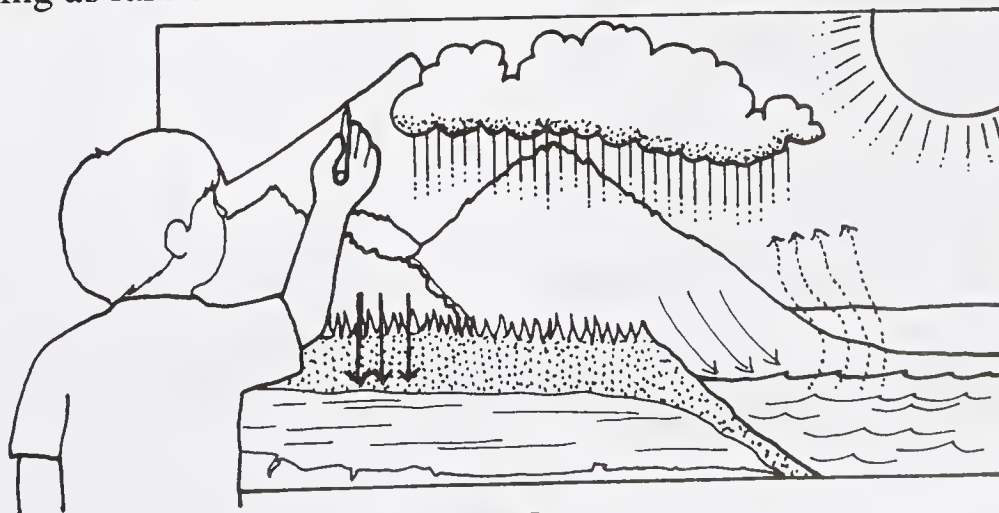
Study the water cycle to understand one reason why the rain forests are important.

## Materials

- Drawing paper
- Pencils
- Colored pencils

## Directions

1. Following the steps below, create a sequential diagram of the water cycle.
  - Draw a large body of water on the right-hand side of the paper, with space below it.
  - Draw the land surface extending left across the page, with lowlands and mountains at the left edge. Add a river coming down the mountain.
  - Under the ground, draw the water table, or underground water filtering system.
  - In the sky, draw a series of rain clouds, placing some above the body of water and some near the mountains. Add mist rising from the water, and rain falling on the mountains.
  - Draw arrows showing the circle made during the water cycle: up from the ocean, into the clouds, falling as rain on the mountains, and flowing down the river into the ocean.



# Rainfall

## Information

The amount of annual rainfall varies among the tropical rain forests of the world. Each will receive at least 80 inches (200 cm). Thundershowers may occur more than 200 days a year making the air beneath the lower canopy almost always humid.

The southern slope of the towering Himalaya Mountains in India receives the heaviest average rainfall in the world, ranging from 200 to 600 inches (508 to 1524 cm) per year. Most of it falls in the summer season when the warm winds flowing inland from the Indian Ocean are heavily laden with moisture. In the Amazon River Basin in South America, the world's largest tropical rain forest, rainfall ranges from 50 inches (130 cm) in the low-lying areas to 120 inches (305 cm) near the Andes Mountains in Peru.

## Project

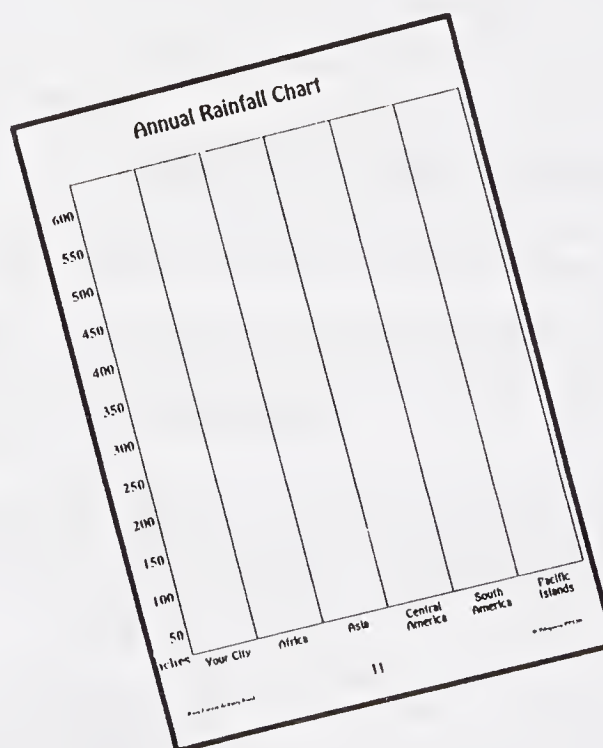
Compare and chart the annual rainfall of the world's rain forests to the city in which you live. Present this information in a three-dimensional graph.

## Directions

1. Divide the class into pairs. Reproduce the Rainfall Chart for each student pair.
2. Do research to find the *maximum* annual amounts of rainfall for rain forests in different regions of the world and for the city in which you live. Use different color crayons to transfer the information to the chart.
3. Using the chart as a guide, transfer the information again to create a dimensional graph. Mark paper towel tubes at one-inch (2.54-cm) intervals, with each inch representing 50 inches (127 cm) of rain. Label each tube with the name of a tropical rain forest or region. Create one for your home city. Cut the tubes at the mark represented by that rain forest's maximum annual rainfall.
4. Tape the tubes together side-by-side. Stand them up to create a visual comparison.

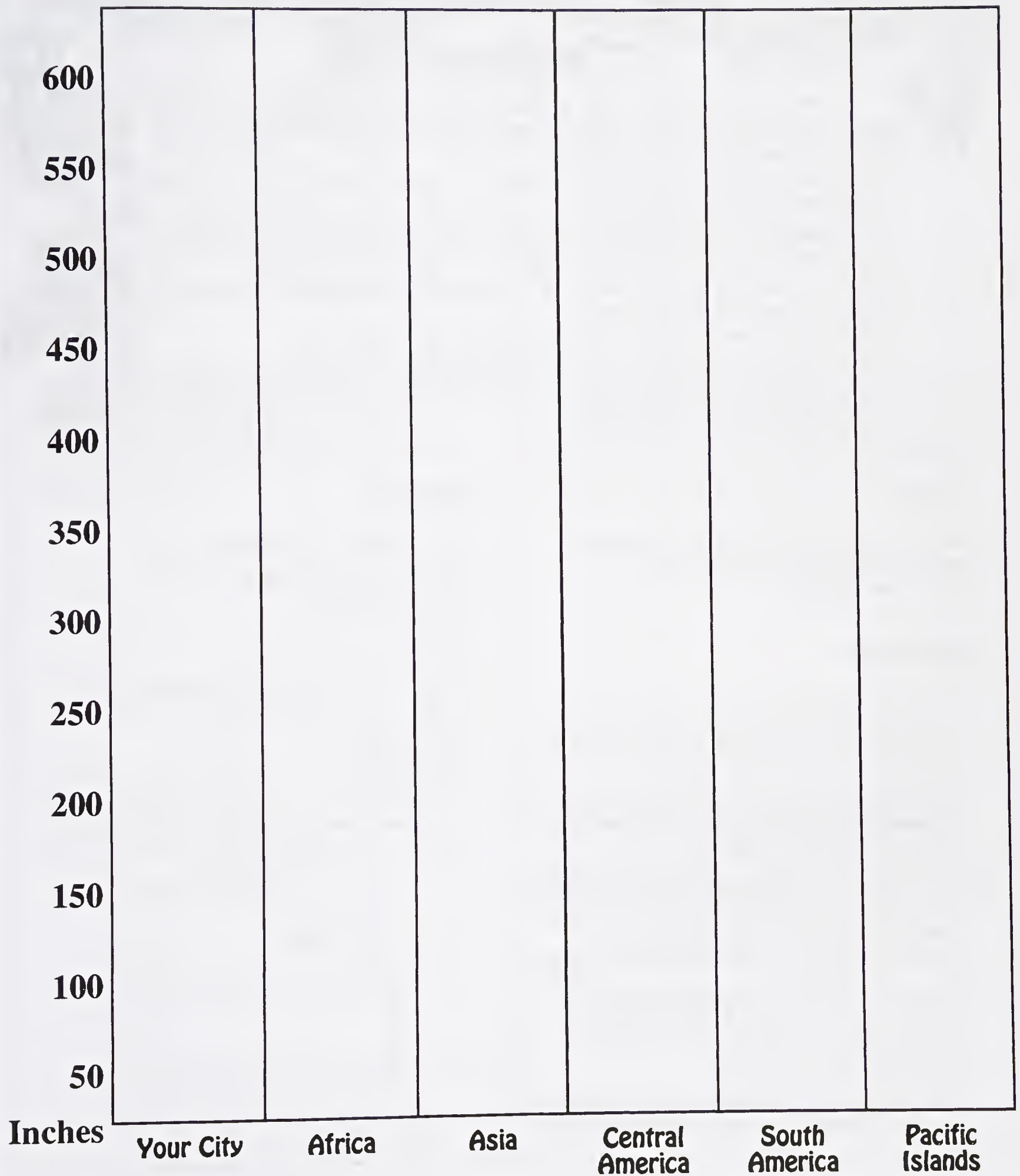
## Materials

- Reference books, atlases
- Rainfall Chart, following
- Crayons
- Tape
- Ruler
- Marking pens
- Paper towel tube
- Scissors





# Annual Rainfall Chart



# Rain Forest Layers

## Information

The rain forest consists of five distinct layers which grow to different heights above the forest floor. Each layer provides a different ecosystem for the animals and plants that live there.

- *The emergent layer* is the highest layer of isolated treetops, new growth rising over 300 feet (91.4 m).
- *The canopy* is a sunny layer of crowns of closely spaced trees, generally between 150 to 250 feet (46 to 76 m).
- *The understory* is a layer made up of shorter trees with long, narrow crowns and the trunks of canopy trees.
- *The shrub layer* consists of widely-scattered, low-light plants.
- *The forest floor* is made up of plants that can survive with almost no light. The humidity and temperature on the forest floor remain more constant than they do in any other layer.

## Project

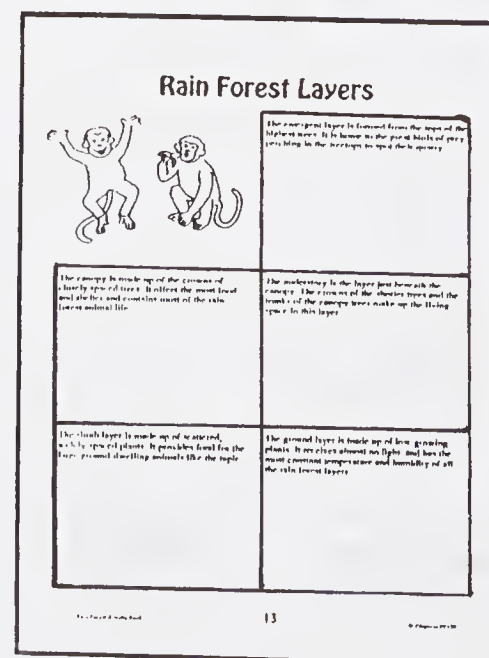
Create a labeled wall hanging that depicts the animal life in the five layers of tropical rain forests.

## Directions

1. Duplicate the pattern page. Use resource books to find pictures of animals that live in the different rain forest layers.
2. Illustrate each section of the pattern page with an appropriate animal, using crayons, markers, or colored pencils.
3. Cut out the individual pieces from the pattern page. Glue the pieces onto the construction paper. Cut the construction paper into sections, leaving a border around each piece.
4. Punch two holes in the top and bottom of each section. Use yarn to tie the pieces together in the correct order, with the emergent layer at the top.
5. Use yarn to tie the emergent layer section to the wire hanger for display of your project.

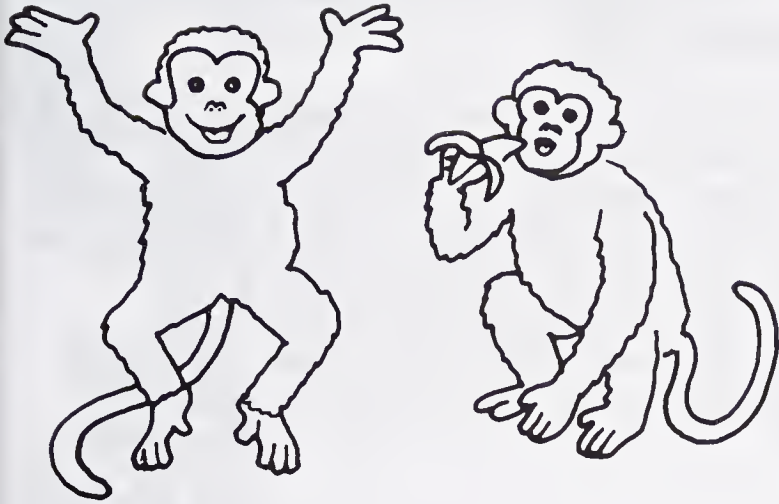
## Materials

- Large sheet of construction paper
- Pattern page, following
- Resource books
- Scissors
- Pencil
- Crayons, colored pencils, or markers
- Yarn
- Wire hanger
- Hole punch





# Rain Forest Layers



The emergent layer is formed from the tops of the highest trees. It is home to the great birds of prey, perching in the treetops to spot their quarry.

The canopy is made up of the crowns of closely spaced trees. It offers the most food and shelter and contains most of the rain forest animal life.

The understory is the layer just beneath the canopy. The crowns of the shorter trees and the trunks of the canopy trees make up the living space for monkeys, ocelots, and more.

The shrub layer is made up of scattered, widely-spaced plants. It provides food for the large ground-dwelling animals like the tapir.

The ground layer is made up of low-growing plants. It receives almost no light, and has the most constant temperature and humidity of all the rain forest layers. It is home to ants, termites, and other rain forest insects.

# Emergent Layer

## Information

The *emergent layer* is the attic above the rain forest canopy. Isolated bursts of the new growth of giant trees grow as high as 300 feet (91.4 m) above the forest floor. Here the great eagle rules, nesting in its watchtower as if it were a green island above the canopy. The eagles and other large birds of prey use the treetops as their perches for spotting unsuspecting quarry—the monkeys, squirrels, and bats below. The slow-moving sloth is another animal that spends its time in the emergent layer, hanging upside-down from the top-most trees, often remaining perfectly still for long periods of time.

## Project

- Conduct a simple experiment to demonstrate the appearance of the emergent layer.
- Compare the height of emergent layer trees to the height of other trees in the rain forest.

## Materials

- Small bush or tree
- Hedge clippers
- Ruler
- Reference books
- Paper
- Pencil
- Graph paper

## Directions

1. Trim back a healthy bush or tree.
2. Watch for new shoots “emerging” from or above the rest of the plant.
3. Record the growth of the new shoots with dated drawings and measurements.
4. Using reference books, make a list of trees found in the rain forest, making note of each tree’s average height.
5. Create a chart on graph paper, having each square represent ten feet (3 m). Graph the height of each of the rain forest trees.





# Canopy

## Information

The *canopy*, about 150 to 250 feet (45.7 to 76.2 m) above the forest floor, is the top layer of the rain forest. This sunny layer is composed of the crowns of all the tall trees. They are spaced so closely together that they resemble, and in effect create, a ceiling. Most of the animal life, as well as their food and shelter, exist in this large area. The canopy provides flowers, fruits, leaves, and nuts to bats, frogs, hummingbirds, lizards, marmosets, monkeys, moths, parrots, sloths, and toucans. While anteaters, monkeys, opossums, and porcupines hang by their tails, flying lemurs and squirrels glide from branch to branch.

## Project

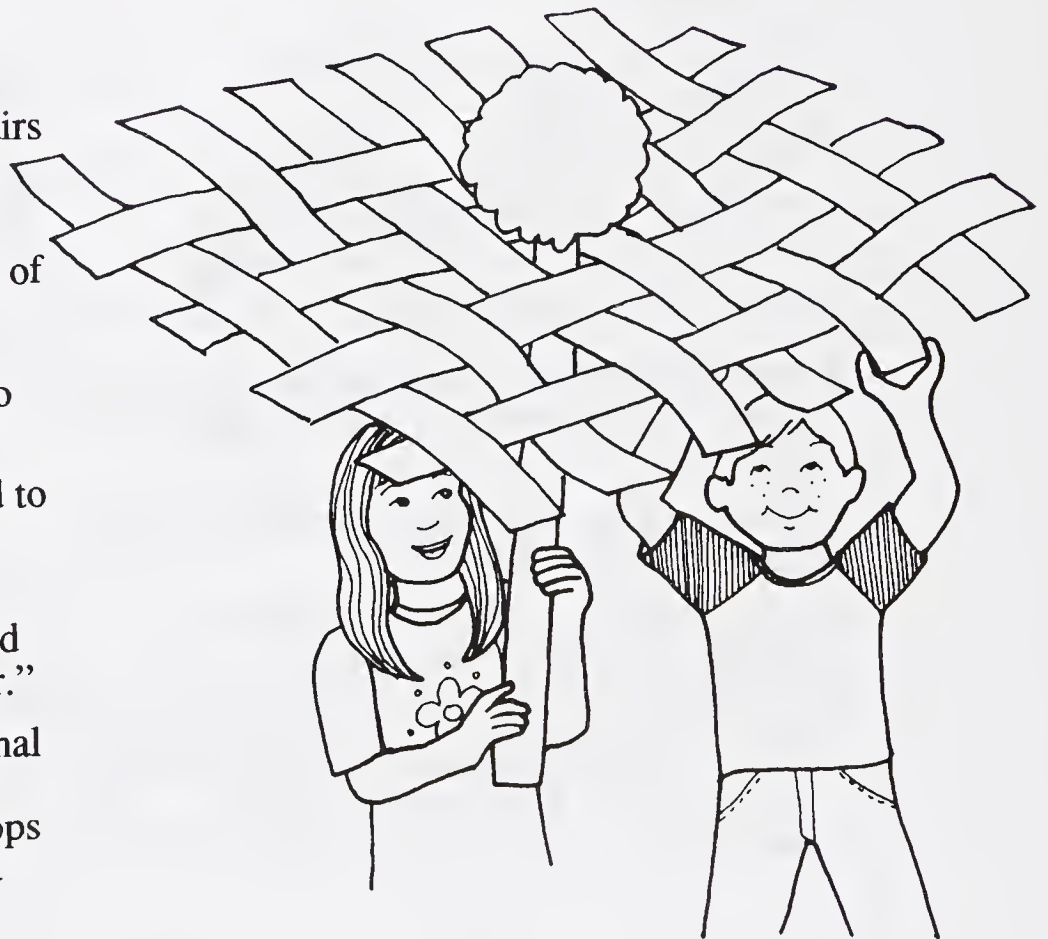
Create a classroom canopy from which to hang rain forest plant and animal creations.

## Directions

1. Cut shelf paper into long one-inch (2.54-cm) strips.
2. Using only half of the strips, have pairs of students hold each end and stand across the room from each other.
3. With the remaining strips, have pairs of students weave over and under until you have formed a web-like canopy. (Depending on size, you may need to staple "intersections.")
4. Hold the finished web high overhead to understand the meaning of *canopy*.
5. Attach the canopy high over your display area. Using an index card and marking pen, label it "Canopy Layer."
6. Attach light-weight, three-dimensional plant and animal projects from the canopy. Be sure to poke a few treetops above the canopy and label that area "Emergent Layer."

## Materials

- Roll of green shelf paper
- Scissors
- Stapler
- Yarn
- Index cards
- Marking pen



# Understory

## Information

The understory is the layer of smaller trees directly below the canopy. This layer is made up of the long, narrow crowns of the shorter trees and the trunks of the taller canopy trees. Although it is dim and shadowy, this area is teeming with life. Looking much as they did in the days of the dinosaur, palms and ferns stretch upward for light. *Lianas*—woody vines—grow upward toward the light above. Boa constrictors wind around lianas trying to blend in with the trees. Howler monkeys sound their booming warnings and scamper through the trees. Toucans crash through leaves. Ocelots creep along the branches, seeking shelter from the rain under a broad leaf tree.

## Project

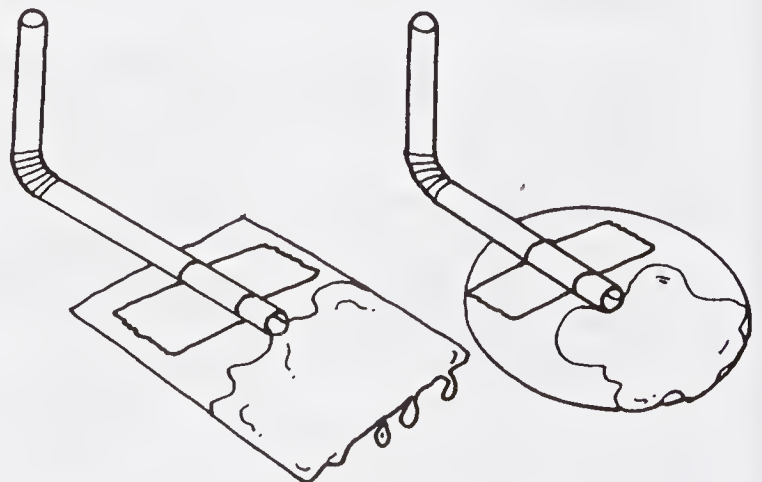
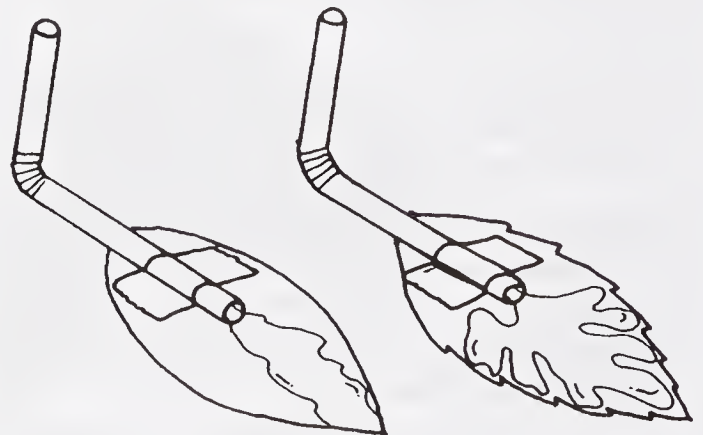
Conduct an experiment with water to determine what leaf shapes provide rain forest animal life with the best shelter.

## Directions

1. Cut four shapes out of cardboard:
  - a small circle
  - a small rectangle
  - a larger smooth-edged leaf shape
  - a smaller jagged-edged leaf shape
2. Tape each cardboard shape to a straw.
3. Holding one shape at a time, slowly pour water out of the pitcher so that it *drips* onto the shape.
4. Observe what happens with each shape, and draw what you observe.
5. Collect leaves of different shapes and conduct the experiment again.
6. Compare the results of the experiments and draw conclusions about which leaves would provide the best shelter in a tropical rainstorm.

## Materials

- Cardboard
- Scissors
- Water pitcher
- Flexible straws
- Large variety of different sized and shaped leaves
- Paper and pencil





# Shrub Layer

## Information

The low-growing plants of the shrub level receive practically no light. This rain forest level remains wet and warm all year long, causing things that fall there to rot quickly. The plants of the shrub layer are widely scattered instead of densely packed as the plants of the upper layers are. This is where the large ground-dwelling mammals find their food and seek their shelter. The giant anteater searches for ant and termite nests. Peccaries, armadillos, curassow, deer, and tapirs chew on seeds and leaves. The bigger animals of this layer are rarely seen by people. Each rain forest has its own varieties of large animals.

## Project

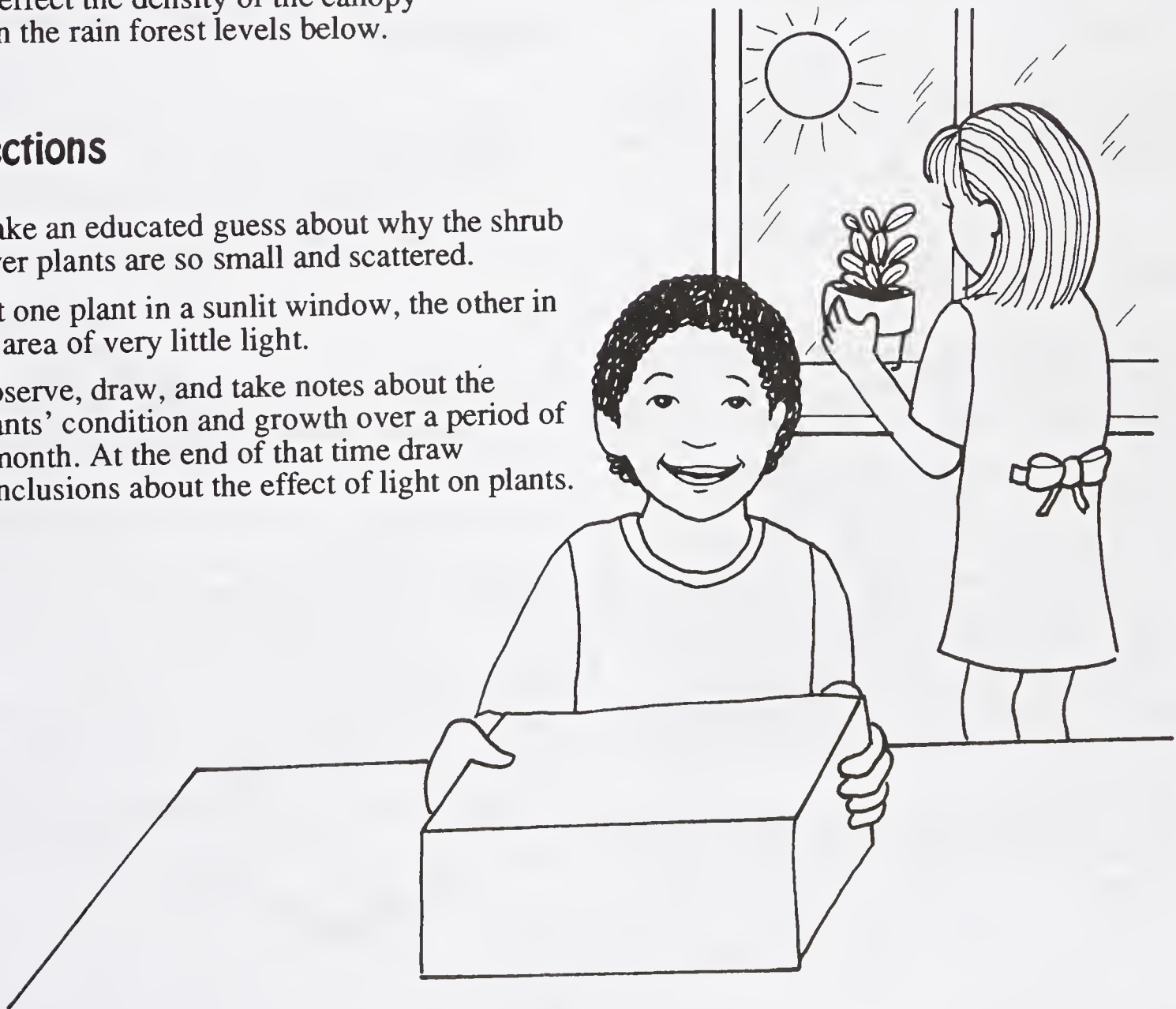
Conduct an experiment to determine what effect the density of the canopy has on the rain forest levels below.

## Materials

- Two small plants

## Directions

1. Make an educated guess about why the shrub layer plants are so small and scattered.
2. Set one plant in a sunlit window, the other in an area of very little light.
3. Observe, draw, and take notes about the plants' condition and growth over a period of a month. At the end of that time draw conclusions about the effect of light on plants.



# Rain Forest Floor

## Information

The rain forest floor does not reveal the abundance of life that exists there. A thin carpet of dead wood and wrinkled, brown leaves conceals the variety of life that exists beneath it. Insects (ants and termites), fungi, and bacteria are constantly at work breaking down the fibers of plants and animal droppings. Although all this decayed material provides a rich soil for plant growth, that soil layer is very thin. The shallow roots of the huge mass of rain forest plants are the first to soak up the nutrients.

Some rain forest plants have very creative root systems. Buttress roots stick out from the base of some tall-trunked trees. The stilt-like roots of the mangrove trees hold the soil and keep it from washing away.

## Project

Examine and record all the plant and animal life found in one square-foot of a "forest floor." Compare the findings to a rain forest.

## Materials

- Magnifying glass for each student or student pair
- Pencil and paper
- Ruler or measuring tape

## Directions

1. Hypothesize what might be found in one square foot of leaf-littered soil in a planter or landscaped area near your home or school.
2. Have each student mark off their own one square foot of the "forest floor."
3. Using a magnifying glass, examine the area closely to see what lives in the leaf litter and under the soil. List, count, and describe (or draw) all the different kinds of plant and animal life found within that square. Multiply the number by ten to understand how much life would be in a square foot of rain forest.
4. Share the findings. What comparisons can be drawn to a square foot of rain forest floor?





# Plants

## Information

Because tropical rain forests have such warm, wet weather, the tropical plants never lose their leaves. Just one acre of rain forest can boast over 80 species of trees as well as an immense garden of fruits, herbs, ferns, moss, lichen, and colorful flowering plants. Often leaves of rain forest plants are large enough to make good umbrellas for the creatures living below. Most leaves are thick and waxy with special long drip-tips to shed the rainwater.

Among the most beautiful of the tropical plants are the delicate, lacy ferns that flourish on the forest floor. High above the ground in the upper canopy are the *epiphytes*, or air plants, like bromeliads and orchids. These plants need no direct connection with the earth, but simply attach themselves to the trees. They get nourishment from the moist air and from decayed matter which collects on the bark of the trees. Bromeliads hold little pools of rainwater in the core of their leaves and eat the insects that fall into it. Tiny tree frogs live out their whole lives in the bromeliad pools.

## Project

- Invite an expert on tropical plants to speak, or take a field trip to a local nursery.
- Create a photo display of tropical plants.

## Directions

1. Ask parents and local nurseries to help you find a tropical plant specialist to speak to your class.
2. Take a field trip to a local nursery that has a good selection of tropical plants. Be sure to take your camera for pictures of the children with specific tropical plants.
3. Create a captioned photo display by gluing or pasting the photos to scrapbook paper. Save your photos and remembrances of the trip in a "Tropical Forest Scrapbook" and display at your culmination activity.

## Materials

- Camera
- Scissors
- Marking pen
- Scrapbook paper
- Glue or paste



# Orchids

## Information

The orchid is one of the most beautiful flowering plants in the world. Orchids that grow in temperate regions are rooted in the soil, but tropical orchids are *epiphytes*, or “air plants,” that grow anchored to the topmost trunks and branches, ensuring their place in the sun. Unlike parasites, they derive water from the moist atmosphere, and they manufacture their own food. Their seeds are blown by the wind from tree to tree. One type of root holds them fast to their hosts, another finger-like root protrudes from the plant, ending in a spongy water-absorbent tip.

The colors of orchids vary from white to deep orchid, and may be streaked or speckled. The size, shape, color, and distinctive markings of the petals of each orchid attract a particular kind of insect to do the fertilizing. This is done by transferring the pollen from the *anther* at the end of the *stamen* of a like orchid to its center *stigma*. Each orchid blossom has three (upper) petals and three (lower) sepals. One petal, called the *lip*, always has a special shape—wide with a fringe, long and narrow, or pouch-shaped. A particularly useful climbing orchid is the *vanilla vine*. Its pods, called the *vanilla bean*, produce the vanilla flavoring used in beverages and foods.

## Project

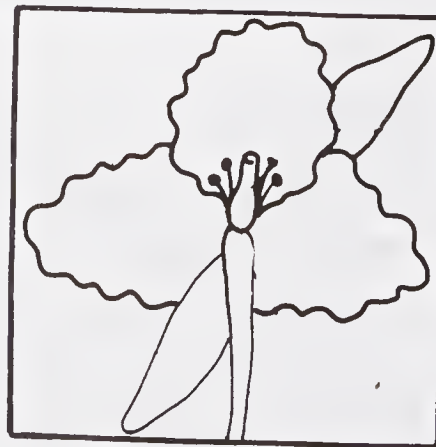
Research, draw, and label a diagram of an orchid plant with a large distinctive blossom.

## Directions

1. Research orchids for a variety of pictures.
2. Work in pairs to discuss the parts and colors of their particular orchid (by names). Stress which parts are on top, which are underneath, and which are in the center of the blossom.
3. Direct the students in a simple art lesson starting in the middle of the paper, drawing and guiding them through each step slowly:
  - the center-most spot of the orchid first
  - the lip and upper petals next
  - the lower sepals
  - the stamen and the pistils
  - the stem and leaves
  - the distinctive markings on their orchid
4. Mount drawings on black construction paper. Add the orchid's name and the labels for each part. Display. Save for culmination.

## Materials

- Resources with pictures of orchids
- Drawing paper
- Drawing pencils
- Colored pencils
- Black construction paper



Ask parents to send in vanilla-flavored foods for the children to sample at a tasting party.



# Ferns

## Information

Ferns grow anywhere in the world, but they are most common in the tropical rain forests. There are over 10,000 kinds of ferns in varying sizes and shapes. Some ferns are so small they appear more like moss. Others have such strong woody stalks they can grow to be 40 feet (12 m) tall. Ferns have neither seeds nor flowers. The new leaves, called fronds, unfurl from coiled tops as they grow, and are covered with scales.

Ferns reproduce from tiny spores enclosed in small, brownish cases that grow in dots or lines on the backs and sides of the leaves. When the spores ripen, the cases burst open and the spores are scattered on the ground. Each spore is capable of developing into a tiny green heart-shaped plant.

## Project

- Examine fern leaves to find the spore cases.
- Grow ferns from spores.

## Directions

1. Work in small groups to observe the spore cases on the fern leaves. Draw what you see and describe it in writing.
2. Shake the spores onto the paper towel. Observe with a magnifying glass, then draw what you see and write a description.
3. Plant a few seeds in a cup labeled with your name and sprinkle with water. Keep moist.
4. Divide the class into three groups. One group will place their cups in very dim light. Another group will place their cups in partial sun. The third group will place theirs in full sun.
5. Observe the plants daily and record what happens with each group.
6. Add the seedling fern plants, each with its experiment's notes and descriptions, to your rain forest exhibit (page 5).

## Materials

- Fern leaves
- Paper towels
- Potting soil
- Plastic cups
- Water
- Paper and pencil
- Magnifying glass



# Rain Forest Animals

## Information

Among the larger animals that live in this year-round hot, wet climate we find jaguars, ocelots, tigers, leopards, tapirs, deer, and anteaters making the forest floor and the understory their home. Many varieties of climbing animals, such as monkeys and sloths, live in the thick overhead canopy, while giant otters and alligators live in the rivers and streams below. Even the larger species of apes, gibbons, and orangutans are found climbing up into the trees. Brightly-colored birds like the hummingbird, parrot, toucan, and macaw, as well as magnificent eagles, nest in the upper trees, fly around in the understory, and feed on the large colonies of ants, termites, bees, butterflies, and other insects. Snakes such as the boa constrictor and spiders like the hairy tarantula grow to giant size. Frogs and lizards come in all sizes, shapes, and colors.

## Project

- Conduct a movement activity showing how different rain forest animals move.
- Complete the animal activities on the following pages.

## Materials

- Index cards, each marked with the name of an animal
- Pencil

## Directions

1. Divide the class into small groups. Select an index card and read the name of the animal to yourself. Keep the name of the animal a secret.
2. As a group, brainstorm all the different ways your animal moves: slowly, quickly, eating, at rest, in danger, etc. Decide how to show each motion, but try not to let the other groups hear you or see you practicing the motions.
3. As each group role-plays the movements of their animal for the class, other class members try to guess what animal is being portrayed.





# Anteater

## Information

The *giant anteater*, sometimes called the ant bear, is a mammal that lives in the trees of tropical forests. It can grow to more than six feet (1.8 m) in length and weighs about 75 pounds (34 kg). The anteater is covered with coarse, brittle hair all the way down to its spectacular plume-like tail. It has a tube-shaped head and a nose that resembles the nozzle of a garden hose. This nose is over 12 inches (30.5 cm) long, but the mouth is the size of your smallest fingernail. The anteater's long tongue is rolled up inside its mouth.

To find food, the anteater rips open ant and termite nests with its strong front claws. It licks the tiny insects up with its two-foot (61 cm) tongue that is covered with sticky saliva. Then it sticks its worm-like tongue deep down into the winding tunnels below to draw more insects out.

Close relatives to the anteater are the aardvark, the echidna, the pangolin, the armadillo, and the tamandua or collared anteater.

## Project

- Conduct an experiment with sticky shelf paper to see how an anteater uses its tongue to eat.
- Hypothesize what and how much he could eat with that tongue.

## Materials

- Sticky shelf paper cut to  $\frac{1}{2}$  x 24 inches (1.27 x 61 cm)
- Scissors
- Paper and pencil

## Directions

1. Give students information about the giant anteater, *excluding what they eat or how*.
2. Hypothesize how a giant anteater eats and what they might eat.
3. Using a strip of shelf paper as a "tongue," search on the playground and in the classroom for things that might stick to the "tongue." Try to "eat" by picking up objects with the shelf paper to determine what size and kinds of foods an anteater might eat.
4. List the possible anteater foods you found that would slip back into the anteater's tiny mouth. Why is an anteater limited to eating food the size of ants and termites? Draw a conclusion about the amount an anteater would have to consume in one day.



# Tarsiers

## Information

*Tarsiers* are tiny primitive primates that live in the rain forests of the Philippine Islands. The largest tarsiers are only six inches (15 cm) long, having a ten-inch (25-cm) tail. On the ground, they hop much like frogs, sometimes leaping as far as five feet (1.5 m). They sleep during the day, clinging to the vertical branches and tree trunks with toes that have built-in adhesive disks. They become active and agile at night and are able to jump distances up to six feet (1.8 m) from tree to tree in search of insects.

## Project

- Create beanbag tarsiers.
- Play beanbag toss games to demonstrate the huge distances the tiny tarsiers are able to jump.

## Directions

1. With cloth, needle, and thread, create a beanbag tarsier, six inches (15 cm) long. Attach a shoestring or leather thong as a tail.
2. In small groups, play a beanbag toss game. Tosses are made from a distance of five feet (1.5 m) for kneeling "ground leaps," and six feet (1.8 m) for standing "air leaps." Students attempt to toss their tarsier into the container with the accuracy required of a tarsier hitting the mark jumping from tree to tree.
3. Groups may decide if they want to play for points or for the challenge. (Score two points for each successful "ground leap." Score five points for each successful "air leap.")

## Materials

- Scraps of cloth
- Small dry beans
- Large-eyed needle and thread
- Leather thong or shoestring
- Small cottage cheese container





# Cats in the Rain Forest

## Information

At first glance, the forest seems colorful and carefree. But when an agile cat is on the prowl, the forest is gripped with fear. The big cats are the largest of the rain forest predators, with the largest of all, the tiger, weighing more than 800 pounds (362.9 kg).

The rain forest cats—lions, tigers, leopards, jaguars—are superb tree-climbers. They stalk their prey by silently moving as close as they can get to their victim, then leaping suddenly from the overhanging branches. The lion is the only cat that hunts in groups to ambush animals traveling in herds. They also steal kills from other animals. Margays and clouded leopards prey on squirrels, birds, and monkeys in the understory, running head-first, spiraling down the tree trunks and hanging onto branches by one foot. Jaguars have been known to attack an eight-foot (2.4-m) alligator.

## Project

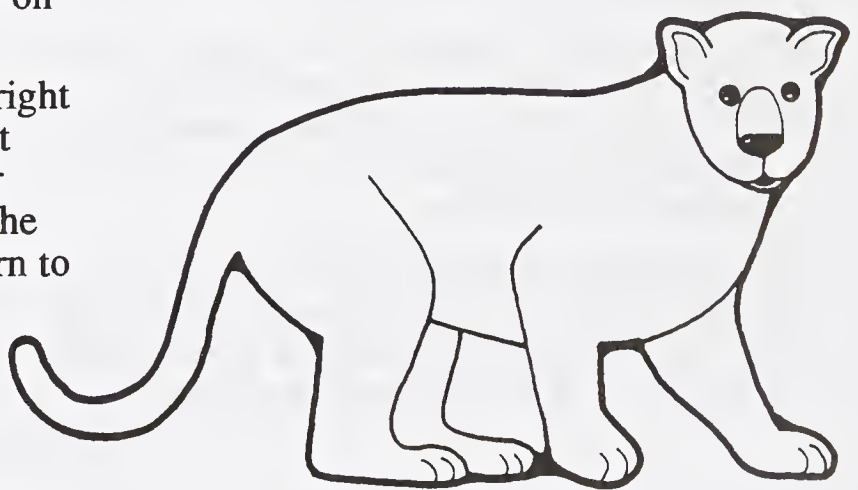
Create a Rain Forest Cats mobile.

## Materials

- Reference books
- Tissue
- Colored marking pens
- Paste or glue
- Wire hanger
- Cat pattern, below
- Butcher paper
- Pencils
- Scissors
- String
- Index cards
- Brown yarn

## Directions

1. Use reference books to find more information on rain forest cats. Write the information on index cards.
2. Draw cat shapes or enlarge the pattern at right using an opaque projector. Make two cat shapes for each animal you want on your mobile. Use marking pens to give them the appropriate colors and markings. Use yarn to add a mane to the lion's head.
3. Glue the shapes together, front to back, stuffing with tissue as you work. Attach index cards to the cats.
4. Use string to hang the cats and their attached cards to the wire hanger to make a mobile.



# Primates

## Information

*Primates*, the mammal families of monkeys and apes, are designed for climbing. Most have arms that are longer than their legs, as well as fingers and toes for gripping.

Apes and Old World monkeys have small tails or no tails at all, powerful hind limbs, large feet for leaping and balance, and a gripping thumb. The chimpanzee, the primate most similar to man, is equally comfortable in trees or on the ground. While the gibbon's long gangly arms hinder travel on the ground, its hook-like hands provide maximum speed while swinging through the trees. The orangutan uses its heavy body to bend branches, its powerful arms to reach its next perch, and its clutching feet as an extra set of hands.

The fast-disappearing gorilla is the largest and most feared of the apes. Scientists say they are actually tranquil, peaceful animals.

## Project

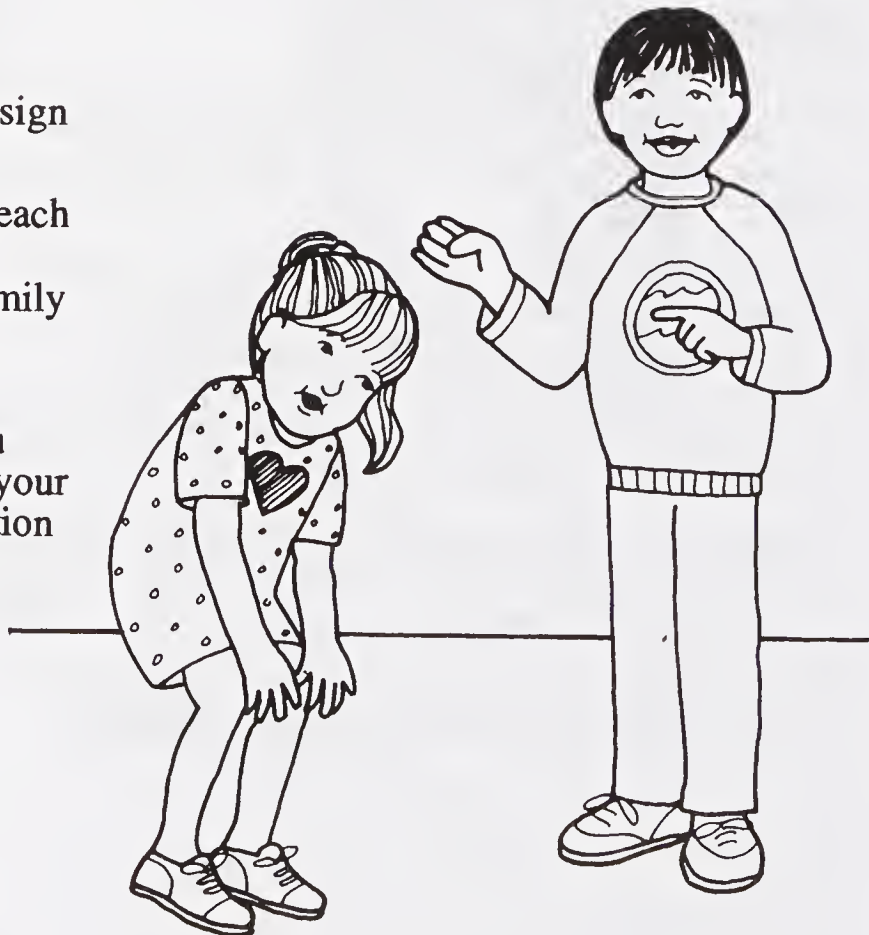
- Create a Primate Primer booklet.
- Present skits about the daily activities of primate families.

## Materials

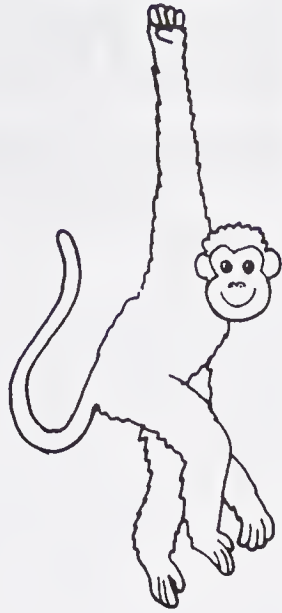
- Reference books
- Primate Primer pages, following
- Pencils
- Video recorder (optional)

## Directions

1. Divide the class into small groups and assign each group a primate family.
2. Reproduce the Primate Primer pages for each group. Use reference books to fill in the information that relates to the primate family assigned. Cut apart the pages and staple together in book form.
3. Plan and present a skit showing what you have learned about the daily activities of your primate family, videotaping the presentation to be shown at the culmination activity.



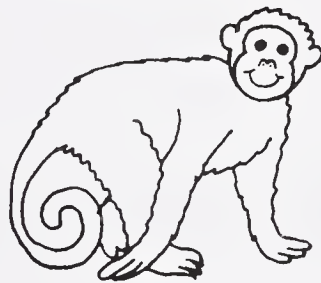




**What is their size, body shape,  
and temperament?**



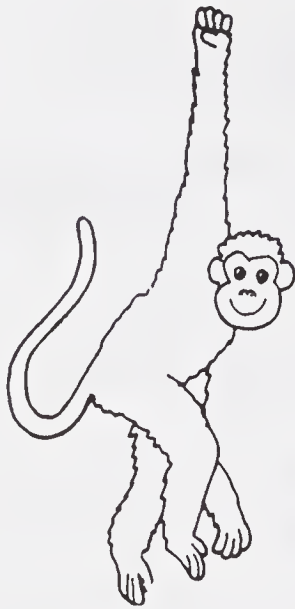
**What special qualities and  
distinctive markings do they have?**



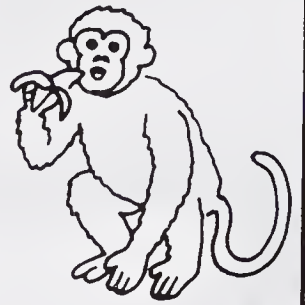
**How and where do they sleep?**



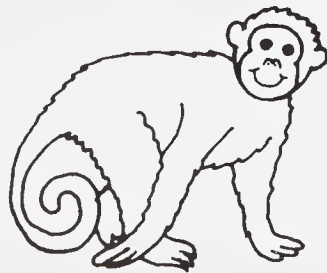
**How do they communicate?**



**How do they travel?**



**What do they eat?**



**How do they spend their days?**



**How are they playful?**



# Gliding Mammals

## Information

There are flying creatures in the Borneo rain forest that appear to fly from tree to tree, but they are not true flyers. They are gliding on membranes that slow their descent. Flying lizards have flaps of skin on each side which allow them to glide up to 20 feet (6.1 m). Flying squirrels have elongated ribs and folds of skin on their bodies to help them sail between trees. The flying snake simply flattens its body and launches itself into the air. The flying gecko “flies” by using both the flaps of skin on its body and its webbed toes.

The flying fox is not really a fox at all, but is a large fruit- and insect-eating bat. At night, these bats leave their hiding places to soar along the forest floor, searching for moths and flying insects.

## Project

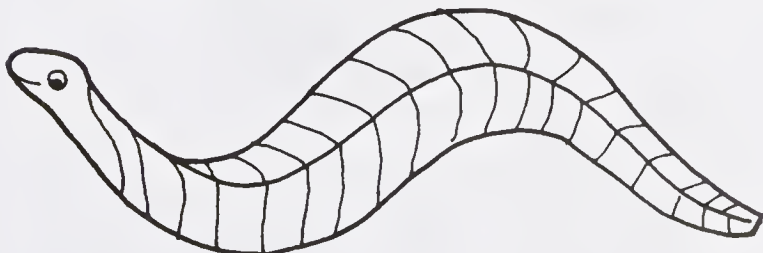
Design an animal glider that can successfully demonstrate how the flaps of skin allow a flying creature to “fly.”

## Materials

- Animal patterns, below
- Poster board
- A variety of papers (wax, crepe, tissue, typing)
- Scissors
- Scotch tape
- Pencil

## Directions

1. Enlarge the patterns at right and below. Trace on poster board and cut out.
2. Cut “wing” flaps to suit your animal and tape them to the pattern. Experiment to see which type of paper works best on your animal.
3. Stand in a line and launch your gliders to see how far they will glide.
4. Tape the flaps on your glider down and launch again.
5. What conclusions can you draw from the demonstration? How has mankind used this same principle to his advantage?



# Animal Camouflage

## Information

Rain forest animals use camouflage or design to conceal themselves from predators. An excellent example of animal camouflage in the rain forest is the three-toed sloth.

Three-toed sloths are very hard to spot in their high canopy home. Their bodies are covered with green algae, enabling them to blend into the leafy background of the branches from which they hang upside down to eat and to sleep. They also move very little (about six feet/1.8 m a minute). Their special protective coloration along with keeping still protects them from predators such as the watchful eagle. Rarely do sloths descend to the ground where their green presence would be evident on the rain forest floor.

## Project

Design a t-shirt that demonstrates the concept of camouflage used by an animal in a rain forest.

## Materials

- T-shirt
- Paper, scissors, glue, safety pins, tempera paint, and other craft materials as selected by students

## Directions

1. Divide the students into small groups to discuss what camouflage is and how it can be helpful to both man and animals.
2. Assign each group a specific rain forest setting from the box below. Instruct them to design a t-shirt that provides camouflage for that particular setting.
3. Test the effectiveness of each camouflage design against a similar background, if available. Discuss the results.

- In the high canopy
- On a branch
- On a tree trunk
- Within a root buttress
- In a bush
- In the limbs of a tree
- On the ground





# Rain Forest Birds

## Information

The dense canopy treetops are teeming with birds. The largest, the giant eagles, appear as a different species in each rain forest. The South American harpy eagle, Africa's crowned eagle, and Asia's monkey-eating eagle prey on sizeable creatures—sloths, tamandua, kinkajou, and opossums.

Motmots and macaws can spend their entire lives in the treetops, never descending to the forest floor. Potoo birds and bay owls imitate bark-like tree stubs in the daytime and catch moths at night. Expert flyers, the hummingbirds swoop, hover, and even fly backwards while feeding on insects and the nectar of flowers. Noisy parrots and green pigeons feed on nuts, ripe fruit, and berries.

In the middle layers, the brightly-colored quetzals remain so still they become very difficult to see. The sound of bird song carries through the forest—the mynah bird's long whistle and the blue-tailed bee-eater's warning call. Hanging upside-down from his perch, the male blue bird of paradise sings out loudly. On the forest floor, the ostrich and the cassowary, both flightless birds, must run from danger instead of flying to safety.

## Project

- Invite a bird specialist to share some tropical birds with the class.
- Create an art display of rain forest birds.

## Materials

- Reference books
- Tropical bird pictures
- Drawing paper
- Black construction paper
- Index cards
- Scissors
- Colored pens
- Glue



## Directions

1. Call local pet stores for the names of bird specialists who would bring a few rain forest birds to class, especially owls, eagles, parrots, macaws, and parakeets.
2. Study reference books and bird pictures to learn about more rain forest birds.
3. Select a favorite tropical bird to research. Write the information you find on index cards.
4. Use art materials to draw a picture of the bird you have selected, coloring it with bright colors.
5. Cut out and mount on black construction paper with glue. Glue the information cards on the back of the construction paper.
6. Share your illustration and information with the class, saving for the culmination activity.

# Parrots

## Information

Parrots are a part of a large family of bright colorful birds found primarily in tropical rain forests. The members of the parrot family are easy to recognize because of their similar build. Very popular as pets, these birds can be very tame and affectionate.

True parrots are chunky in build and have square tails. The largest parrots are the macaws of Central and South America. They are brightly colored with long, pointed tails. Most of the cockatoos of Australia are white and have tufts of long feathers called crests on their heads. Parakeets are small, usually with green feathers and pointed tails. Most parrots like to eat fruits, nuts, seeds, and buds. Parrots lay their round, white eggs on the ground, in tree holes, in cracks in rocks, or in holes dug into termite nests.

## Project

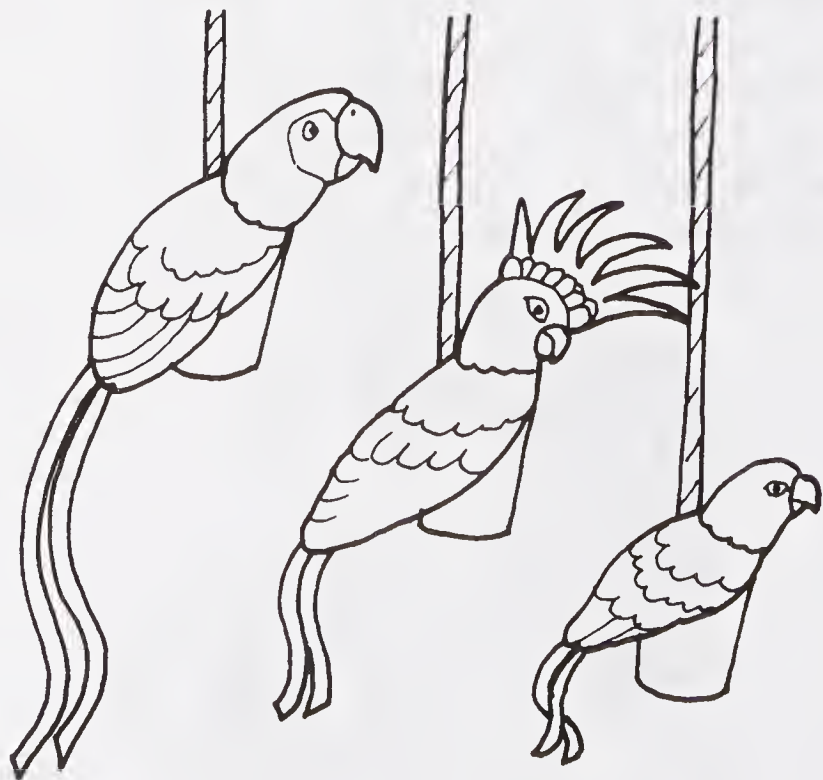
Create a three-dimensional paper parrot to hang on your rain forest canopy.

## Directions

1. Use reference books to learn about the different kinds of parrots and select your favorite.
2. Write a brief description of your parrot on an index card. Include at least three interesting facts.
3. Recreate the parrots from cups and construction paper.
  - Cover cup with the body color.
  - Cut strips of paper to form tail feathers. Glue to the cup.
  - Use the pattern on the following page to create head and wings. Glue to the cup.
4. Attach the description card to the lower front of the body. Attach a length of yarn for hanging.
5. Suspend the parrots from the class rain forest canopy (page 15).

## Materials

- Construction paper in a variety of colors
- Pattern page, following
- Paper or plastic cup
- Scissors
- Green or black yarn
- Pencils
- Index cards
- Glue
- Reference books







# Insects and Arachnids

## Information

The rain forest is home to a vast number of insects, some familiar the world over and others that are very unique. The oldest rain forest insect is the cockroach, which dates back to the age of the dinosaurs. The Predator water bugs attack fish and other small water creatures. Ladybugs hunt for aphids and other crop-damaging insects. The rain forest is also home to the tiny mosquito that carries diseases like malaria.

Some rain forest insects imitate parts of plants to help them survive: the thorn insect, the leaf-mimicking katydid, the praying mantis, the New Guinea weevil, and the stick insect. Well-camouflaged caterpillars turn into 12-inch (30.5-cm) moths or the beautiful butterflies with special senses in their legs for finding food.

Colonizing insects include ants, termites, wasps, and bees. Army ants swarm by the millions across the land, eating other insects in their path.

Rain forest spiders include the seven-inch (17.8-cm) bird spider, also known as a tarantula. It stays in its burrow during the daytime, coming out to hunt for food at night. Scorpions also hide during the day under leaves and logs, searching the forest floor for insects after dark.

## Project

- Observe insects that can also be found in the rain forest.
- Complete an Insect Observation Checklist.

## Directions

1. Use reference books to find out about some of the insects listed above, and to add to the list of insects that live in the rain forest.
2. Reproduce the Insect Observation Checklist.
3. Conduct a search for insects that you can also see in a rain forest, observing them as closely as you safely can with the magnifying glass.
4. Complete the Insect Observation Checklist, and make comparisons between the insects you found and those that live in the rain forest.

## Materials

- Reference books
- Magnifying glass
- Pencil
- Insect Observation Checklist, following







# Bees and Butterflies

## Information

Rain forest bees and butterflies serve an important function. They drift from flower to flower, drinking the nectar and seeking pollen to feed their young. In the process, pollen from one flower is often brushed onto the stigmas of other flowers, enabling each stigma to grow into a seed. In this way, bees and butterflies help to *pollinate* the rain forest flowers so they will become fruits for the birds, monkeys, bats, and other animals to eat.

## Project

Demonstrate the process of pollination as done by bees and butterflies.

## Materials

- Feathers
- Flowers with visible stamens and stigmas (reproductive cells)

## Directions

1. Each student needs a feather and a flower.
2. Go from flower to flower, using your feather to collect a tiny amount of pollen from one flower and dusting it onto another.





# Reptiles

## Information

Reptiles, large and small, can be found throughout the rain forest. Snakes disappear in the canopy or lie in wait among fallen leaves to catch birds and other small animals. Many snakes are poisonous, like the 18-foot (5.5 m) cobra and the black mamba. The anaconda, growing to 30 feet (9 m) in length, swallows its prey whole, taking its time to digest it. The boa constrictor wraps around its victim, either suffocating or crushing it. The bushmaster snake is a rare type of pit viper.

Using suction pads on their feet, lizards and frogs hide and lay their eggs on tree trunks, on the undersides of leaves, and in bromeliad pools. They search out plants to eat and insects to snatch with their long tongues. The green iguana uses its tail to lash out at its enemies.

Along the rivers, turtles dive beneath the surface. Alligators and crocodiles lurk submerged, waiting to attack unwary mammals that come to drink. The log-like caiman and the long-snouted gharial feed on large numbers of fish.

## Project

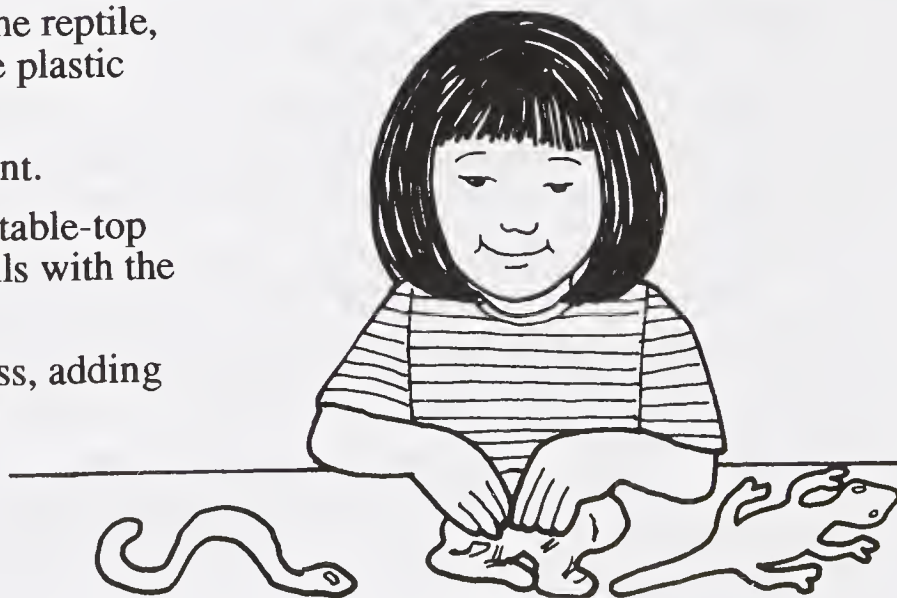
- Sculpt clay figures for an exhibit of *Rain Forest Reptiles*.

## Directions

1. Use reference books to learn about a specific reptile, writing a description and five interesting facts on an index card.
2. Using the clay, sculpt a model of the reptile, adding distinctive features with the plastic utensils.
3. Allow the model to harden and paint.
4. Use construction paper to create a table-top river scene, adding landscape details with the natural materials gathered.
5. Share the clay models with the class, adding them to the display along with the information cards.

## Materials

- Reference books
- Small index cards
- Pencils
- Self-hardening clay
- Tempera paints and brushes
- Plastic knives, forks, and spoons
- Blue and green construction paper
- Pebbles, rocks, twigs, and branches



# Rain Forest Survival

## Project

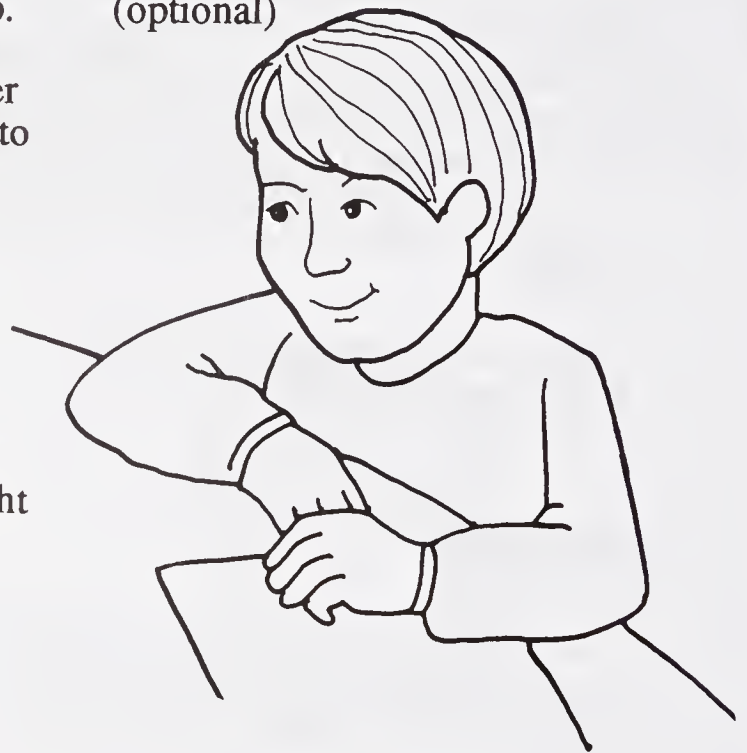
Conduct a problem-solving activity based on knowledge of rain forest conditions.

## Directions

1. Divide class into small groups of three or four students of varying ability levels.
2. Read aloud the script below, allowing appropriate pauses to develop mental pictures.
3. Reproduce the Survival Plan sheet for each group. Review the information together. Explain that everyone must use the Survival Kit items, whether walking or staying. Allow 30 minutes for groups to complete the assignment.
4. Report and discuss each group's decision and the merits of each choice.
5. At the conclusion, explain that rain forest specialists tell us that people who stay with the airplane would probably be found quite soon and would survive. Those who try to walk out would probably not survive. Why do they think that might be true? Discuss whether students agree with the scientists.

## Materials

- Script, below
- Survival Plan Sheet, following
- Pencil
- Objects on the Survival Kit list (optional)



## Script

"Imagine you are experiencing the events in this scenario. Let yourself mentally see, hear, touch, taste, and feel emotionally, each step of your journey.

You are on an airplane flight over the Amazon rain forest. What kinds of things can you see yourself doing on the flight? (Reading...chatting with seat mate...looking down at the rain forest below you...eating a meal from your tray...watching an in-flight movie...)

"You fly into a tropical rainstorm. What might you be experiencing? (Plane bouncing in the high winds...heavy rains pounding the plane...flying through dark clouds...)

"The pilot announces that he has lost radio contact with the rest of the world. You have been blown off course. The plane's instruments have failed. An emergency landing is in progress.

"The airplane lands with only the supplies listed on the Survival Plan Sheet. The storm blows over, and the sun comes out. Now you will have to use all the things you have learned about rain forests to decide on the best plan for your survival. Will you walk to the nearest town or will you stay with the airplane and wait to be rescued? How will you use each item in the survival kit?"



# Survival Plan Sheet

**Directions:** Discuss each question carefully before you write your group's decisions. Your whole group must agree on all parts of your decision. Be ready to share the reasons for all of your choices.

1. Will your group walk four days to the nearest city? If so, why?
2. Will your group stay with the airplane? If so, why?
3. From the list below, circle eight items that your group agrees are essential for your survival. Discuss how you will use each one.

## Rain Forest Survival Kit

|           |                       |               |                  |
|-----------|-----------------------|---------------|------------------|
| food bars | pencil and paper      | first aid kit | large trash bags |
| umbrella  | favorite book         | scissors      | parachute        |
| compass   | small mirror and comb | string        | safety pin       |
| TV Guide  | waterproof matches    | knife         | portable radio   |
| cash      | sweater or jacket     | flashlight    | bow and arrow    |

### TEAM EVALUATION:

4. In what ways did your group work well together?
5. What would have helped you to work better as a group?

# Rain Forest Gifts

## Information

Inhabitants of the rain forest harvest, use, and sell thousands of different kinds of plants for food, fuel, and medicine without depleting the rain forest's resources. Many of the fruits and fruit-nuts we eat—peppers, bananas, pineapple, avocados, kiwi, papaya, citrus, peanuts, Brazil nuts, cashews, and cacao for chocolate—first came from the rain forests.

House plants like African violets, Christmas cactus, bromeliads, and orchids are rain forest plants. One-quarter of all the medicines found in our drug stores are derived from plants and animals of the rain forests. The periwinkle flower is the source for a potential cancer cure. Liquid rubber, *latex*, is gathered by “tappers” from the same trees year after year without harming the trees. Three kinds of rain forest wasps, used to control insects that damage citrus crops, are examples of the use of rain forest insects as a potential alternative to expensive, harmful pesticides.

## Project

Create an exhibit of “Rain Forest Gift Products” that are not destructive to the rain forest.

## Directions

1. As a class, hypothesize which things we buy and use that are gifts; that is, they are *not destructive* to the rain forests. Create a list of your ideas.
2. See how many of the products you can find at home. Select one to bring to class.
3. Research your product and write a brief description of it. Place it in a table-top exhibit titled *Rain Forest Gift Products*.

## Materials

- One nondestructive rain forest product from home
- Index cards
- Pencil
- Black marking pen
- Table for exhibit





# Slash and Burn

## Information

From ancient times, rain forest natives have hunted, gathered, and traded for their food without doing harm to the rain forest. But many modern rain forest tribes have been mistreated and their native lands stolen from them. Thousands of homeless people leave the cities to try to farm small parcels of land for food and money. Without understanding how to exist in the forest, they cannot live as hunter-gatherers. They chop down large areas of trees and set them on fire in order to clear the land. They plant their seeds in the ashes, anxious to begin raising the crops that will help their families to survive. But soon the thin layer of soil begins to give poorer harvests. The farmers must move their families and begin the tree cutting and burning process again. When the heavy rains come there are no trees to hold the soil in place, so the soil is washed away.

## Project

Demonstrate what happens to rain forest soil with no plant roots to hold it in place.

## Directions

1. Work in an outdoors area with access to water.
2. Closely observe the two trays and form a hypothesis as to what happens when rain forests are destroyed, leaving only barren soil.
3. Tilt the trays slightly at one end. Begin by dripping water slowly onto the higher side of the tray of sod. Gradually increase the flow of water. Discuss what would happen in the heavy downpours of rain in the tropics.
4. Repeat the process with the tray of soil. Compare what happens when there are no plants or roots to hold the soil.

## Materials

- Tray of sod
- Tray of soil
- Water
- Garden hose



# Vanishing Rain Forests

## Information

Scientists tell us that each second, a rain forest region the size of a football field is being destroyed. At this rate of destruction, there will be no rain forests remaining by the year 2050. Lumber companies cut and bulldoze trees to supply the hardwood (teak, mahogany, and ebony) demanded by the world's industrial countries. Big businesses clear land to build dams, reach mineral reserves rich with iron, copper, and uranium, or to establish banana, cocoa, and coffee plantations. More than half of Central America's rain forests have been cleared to make way for cattle ranches. Compounding the problem are the many people who have moved into rain forests, slashing and burning huge areas in order to plant crops to sustain their families.

After the forests are gone, these areas lose plant and animal life. Meager fertile topsoil makes it difficult for seeds and young trees to sprout and survive. The effects of the disappearing rain forests are increasing each year.

## Project

Complete one or more projects to build awareness for rain forest conservation.

## Materials

- As indicated for each conservation project

## Reforestation

*Carry out a local version of a reforestation program. Plant trees or bushes in areas where existing trees have been destroyed.*

### Materials

- Tree seedlings
- Planting mix
- Shovel

### Directions

1. Locate neighborhood areas where there is a need for trees or plants.
2. Obtain tree seedlings or plant cuttings.
3. Dig holes and plant trees based on the instructions of a local nursery.





# Conservation Projects

## Letter Campaign

*Write letters to environmental and conservation groups to ask what more you can do locally.*

### Materials

- Stationery
- Envelope
- Pencil
- Stamp

### Directions

1. Compose letters to the concerned organizations featured at right or to other groups with similar goals found in newspapers, magazines, or on the Internet.
2. Track the responses and decide on a course of action for carrying out a rain forest conservation project.

**The Children's Rainforest**  
PO Box 936  
Lewiston, ME 04240

**National Wildlife Federation**  
1400 16th Street NW  
Washington, DC 20036-2266

**Friends of the Earth/UK**  
2628 Underwood Street  
London N17JU  
United Kingdom

**Smithsonian Tropical Research**  
APO  
Miami, FL 34002-0011

## Poster Campaign

*Create posters to generate school-wide interest in rain forest conservation. Be prepared to answer student questions.*

### Materials

- Poster board
- Tempera paints
- Masking tape
- Paint brush

### Directions

1. Discuss the features of a persuasive poster. Brainstorm slogans and poster content.
2. Design and paint conservation posters.
3. Tape in pre-arranged places on the school campus. Direct students with questions or an interest in joining the effort to your classroom.





# Writing Adventures



Select one of the writing projects below to complete using the information you have gained about the rain forest.

## Rain Forest Journal

Create a journal entry for a rain forest adventure.

### Directions

1. Reproduce the journal page.
2. Using what you have learned, create a story of your adventures in the rain forest. Write a journal entry for at least one day, including as many factual details as you can.
3. Color and decorate the journal page. Mount with glue to colored construction paper.
4. Display at the culmination activity.

### Materials

- Journal page, following
- Colored construction paper
- Paper • Pencil • Glue



## Travel Brochure

Create a travel brochure for a rain forest.

### Directions

1. Examine sample brochures and brainstorm a list of things that might be included in a travel brochure for a rain forest.
2. Using what you have learned, create a travel brochure that will encourage prospective travelers to visit a rain forest. Be sure to include information about what they will find there.
3. Design a distinctive cover and color with marking pens.
4. Display at the culmination activity.

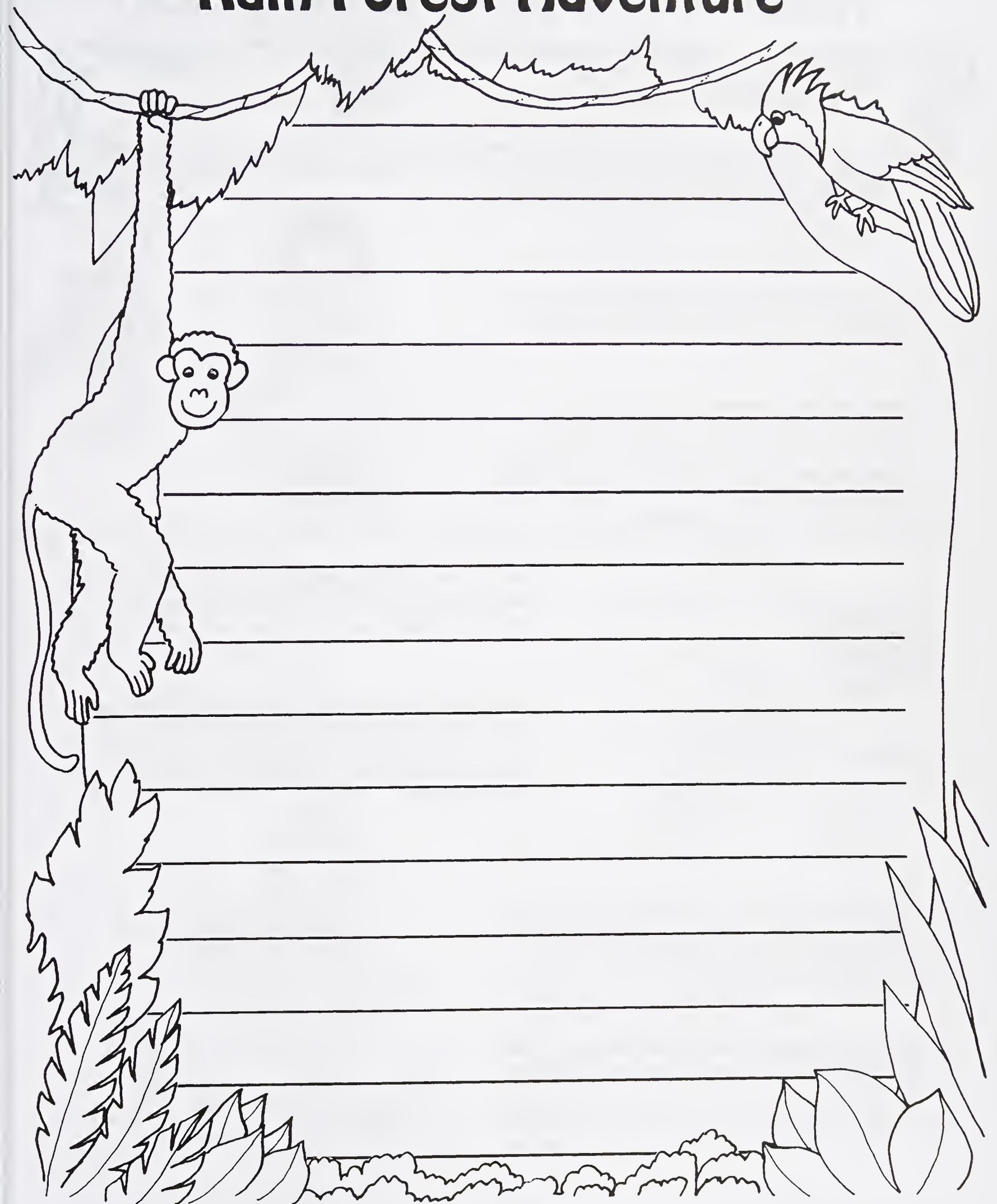
### Materials

- Sample travel brochures
- Colored marking pens
- Paper • Pencil

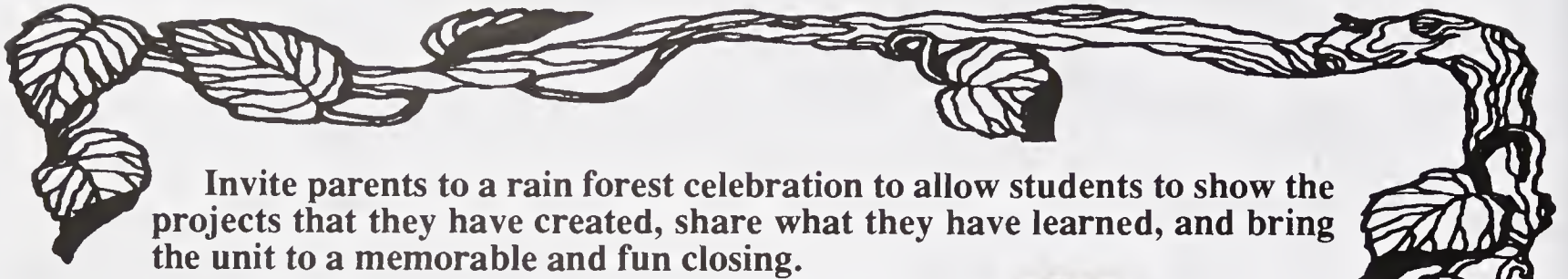




# Rain Forest Adventure



# Rain Forest Celebration



Invite parents to a rain forest celebration to allow students to show the projects that they have created, share what they have learned, and bring the unit to a memorable and fun closing.

1. At least two weeks before the event, create an invitation to your Rain Forest Celebration (see project, page 47).
2. Select at least one rain forest project to present—a model, chart, demonstration, experiment, collection, drawing, or display. Rehearse and prepare original writings and/or dramatic creations.



3. Arrange any displays of photographs taken or shared during the unit. Make arrangements to show any video recordings that were made.
4. Brainstorm a list of refreshments appropriate to a rain forest celebration. (See recipes, page 47.) Make a list of needed ingredients and serving equipment, and make arrangements to have them available.

5. Develop a checklist of set-up jobs to be done before the parents arrive and clean-up jobs to be done when the guests have gone. Make assignments for each job.
6. Evaluate what you've learned from your rain forest unit. What have you learned? What did you enjoy?

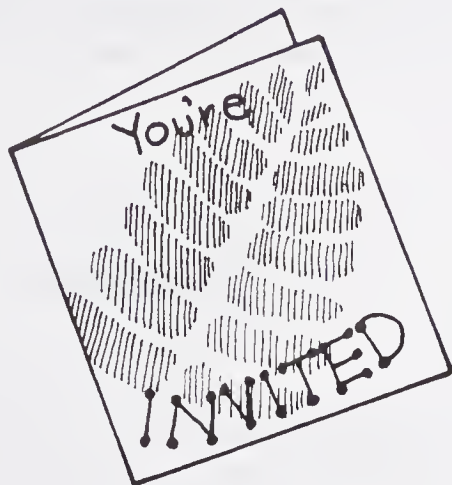




# Celebration Invitations

## Materials

- White construction paper
- Fern fronds
- Green tempera paint
- Aluminum pie pan
- Paper
- Pencil



## Directions

1. Fold construction paper in half to form a cover.
2. Dip fern frond into green paint in aluminum pie pan. Carefully lay the fern on the construction paper cover. Lift carefully to leave a neat print.
3. Glue paper to inside of cover. Compose and write invitation information.

# Celebration Recipes

## Rain Forest Fruit Layers

Blend together:

- $\frac{1}{3}$  cup (80 ml) lemon juice
- 8 ounces (227 g) sour cream
- 1 tsp. (5 ml) vanilla extract

Wash 4 cups (1000 ml) fresh fruit. Layer in a dish with sour cream mixture. Makes eight large or 16 small servings.



## Tropical Treats

- 1 box vanilla wafers
- 1 box powdered sugar
- $\frac{1}{2}$  cup (125 ml) margarine at room temperature
- 1 small can frozen orange juice concentrate, thawed
- 2 cups (500 ml) shredded coconut

Crush vanilla wafers. Mix with powdered sugar, margarine, and orange juice in bowl. Roll into one-inch (2.54 cm) balls. Roll in coconut. Store in refrigerator. Serve at room temperature. Makes 60 cookies.

# World Wide Web

## Information

You don't have to travel to the rain forest to learn more about it. The World Wide Web offers a wealth of resources for your exploration. The web pages below were active at publication date but their continued presence is not guaranteed. Find your own adventure on the Internet, learning about rain forest plants and animals, and learning how to help save this valuable resource.

### Address

### Content

|                                                                                                                            |                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="http://www.ran.org/ran/">www.ran.org/ran/</a>                                                                     | <i>Rain Forest Action Network</i> —lots of information about rain forests and updates on the latest "Save Our Rain Forests" campaigns. Special page for students. |
| <a href="http://www.rainforest-alliance.org/">www.rainforest-alliance.org/</a>                                             | <i>Rainforest Alliance</i> —conservation programs and a rain forest tour. Also has a coloring book of rain forest birds to download.                              |
| <a href="http://www.pbs.org/tal/costa_rica/textonly.html">www.pbs.org/tal/costa_rica/textonly.html</a>                     | <i>Science in the Rainforest</i> —hosted by PBS. Take a walk through the rain forest, Rain Forest Trivia Questions, Rainforest Facts and More.                    |
| <a href="http://museum.nhm.uga.edu/rainforest/rainforestlinks.html">museum.nhm.uga.edu/rainforest/rainforestlinks.html</a> | <i>Rainforest Adventure</i> —from the Family Discover Series. Offers links to find specific information on rain forest plants, animals, and other topics.         |
| <a href="http://www.rain.org/campinternet/rainforest/index.html">www.rain.org/campinternet/rainforest/index.html</a>       | <i>Classroom Rainforest</i> —offered by RAIN Community Internet, individuals, families, or entire classrooms can take part in rain forest adventures.             |





## Hands-on Science Activity Books!

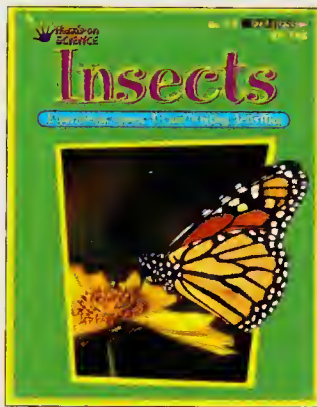
- Excellent Science Fair Resource
- Meets the New Science Standards of Learning
- Provides Experience with the Scientific Method

### Flipside Activities

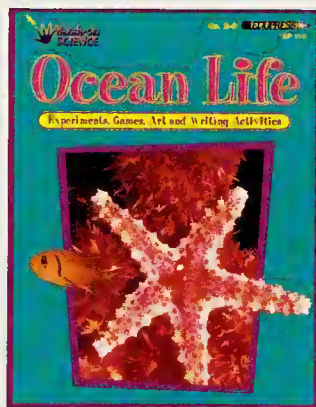


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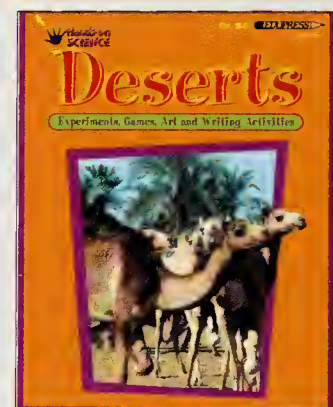
EP115 Insects



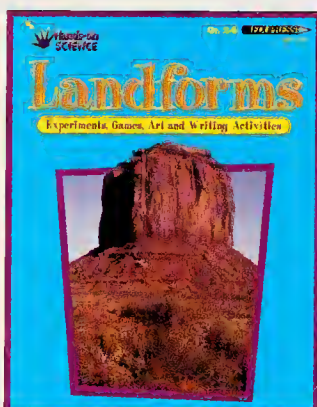
EP116 Ocean Life



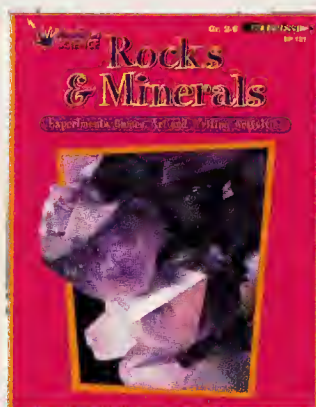
EP117 Plants



EP118 Deserts



EP119 Landforms



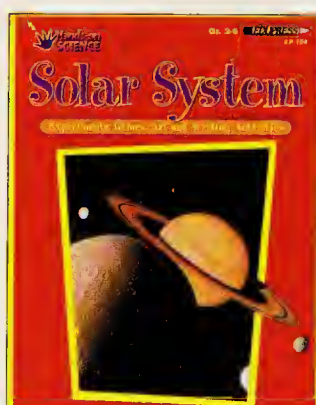
EP121 Rocks & Minerals



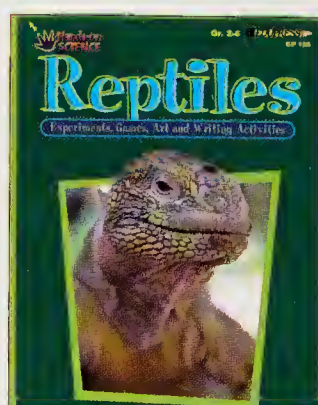
EP122 Space Exploration



EP123 Weather



EP124 Solar System



EP125 Reptiles



EP126 Dinosaurs

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